

CLAIMS

What is claimed is:

- 1 1. A hydrocyclone liner comprising:
2 a head section having a fluid inlet and overflow outlet, the head section providing an
3 involute formed primarily of a first material having a first resistance to erosion;
4 a separation section having an underflow outlet, the separation section being formed
5 primarily of a second material having a second resistance to erosion; and wherein
6 the first resistance to erosion is generally greater than the second resistance to erosion.
- 1 2. The hydrocyclone liner of claim 1 wherein the head section and separation section are
2 removably affixed to one another.
- 1 3. The hydrocyclone liner of claim 1 further comprising a reinforcement layer disposed upon
2 the separation section.
- 1 4. The hydrocyclone liner of claim 3 wherein the reinforcement layer is comprised of a
2 fiber-reinforced epoxy.
- 1 5. The hydrocyclone liner of claim 4 wherein the fiber-reinforced epoxy is reinforced with
2 carbon fibers.

- 1 6. The hydrocyclone liner of claim 4 wherein the fiber-reinforced epoxy is reinforced with
2 glass fibers.
- 1 7. The hydrocyclone liner of claim 4 wherein the fiber-reinforced epoxy contains a plurality
2 of fibers that are disposed axially within the epoxy to provide resistance to bending of the
3 separation section.
- 1 8. The hydrocyclone of claim 3 wherein the reinforcement layer is formed of a sprayed on
2 material.
- 1 9. The hydrocyclone liner of claim 1 wherein the separation section comprises a pair of
2 tubular portions that are interconnected by a tubular joint member.
- 1 10. The hydrocyclone liner of claim 1 wherein the first material comprises tungsten carbide.
- 1 11. The hydrocyclone liner of claim 1 wherein the first material comprises silicon carbide.
- 1 12. The hydrocyclone liner of claim 1 wherein the second material comprises ceramic.
- 1 13. The hydrocyclone liner of claim 1 wherein the second material comprises surface
2 engineered stainless steel.

1 14. The hydrocyclone liner of claim 13 wherein the second material is surface engineered by
2 case hardening.

1 15. The hydrocyclone liner of claim 13 wherein the second material is surface engineered by
2 coating.

1 16. A hydrocyclone liner comprising:
2 a head section having a fluid inlet and overflow outlet; and
3 a separation section having an underflow outlet, the separation section being removably
4 affixed to the head section.

1 17. The hydrocyclone liner of claim 16 further comprising an external structural support for
2 the separation section.

1 18. The hydrocyclone liner of claim 16 wherein the head section is formed of a material that
2 provides a greater erosion resistance than that provided by the separation section.

1 19. The hydrocyclone liner of claim 16 wherein the head section is substantially formed of
2 tungsten carbide.

1 20. The hydrocyclone liner of claim 16 wherein the head section is substantially formed of
2 silicon carbide.

1 21. The hydrocyclone liner of claim 16 wherein the separation section is substantially
2 comprised of a stainless steel duplex material.

1 22. The hydrocyclone liner of claim 16 wherein the head section and the separation section
2 are removably affixed by a flange assembly.

1 23. The hydrocyclone liner of claim 17 wherein the structural support comprises a sleeve
2 formed of a fiber-reinforced epoxy.

1 24. The hydrocyclone liner of claim 17 wherein the structural support comprises a tubular
2 joint that interconnects portions of the separation section.

1 25. A hydrocyclone liner comprising:
2 a head section having a fluid inlet and overflow outlet, the head section containing an
3 involute being substantially formed of a highly erosion-resistant first material; and
4 a separation section having an underflow outlet, the separation section being formed of a
5 second material that is more physically resistant to bending and impacts than the first material.

1 26. The hydrocyclone liner of claim 25 wherein the separation section is removably affixed to
2 the head section.

2 27. The hydrocyclone liner of claim 25 wherein the first material comprises tungsten carbide
3 and the second material comprises hardened stainless steel duplex.

1 28. The hydrocyclone liner of claim 25 wherein the head section contains a removable
2 involute insert formed of highly erosion resistant material.

5